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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
| 10/565,809 | 11/13/2007 | Hyang-Mi Kim | YHK-0155 | 9707 |
| 34610 | 7590 | 09/08/2009 | EXAMINER | |
| KED & ASSOCIATES, LLP P.O. Box 221200 Chantilly, VA 20153-1200 | | | GREEN, TRACIE Y | |
| ART UNIT | PAPER NUMBER | | | |
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

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|------------------------------|--------------------------------------|-----------------------------------|
| Office Action Summary | Application No. 10/565,809 | Applicant(s) KIM ET AL. |
| | Examiner Tracie Green | Art Unit 2879 |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED. (35 U.S.C. § 133).

Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) Responsive to communication(s) filed on 24 August 2009.

2a) This action is FINAL. 2b) This action is non-final.

3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4) Claim(s) 4,30,31,34 and 35 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5) Claim(s) _____ is/are allowed.

6) Claim(s) 4,30-31, and 34-35 is/are rejected.

7) Claim(s) _____ is/are objected to.

8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9) The specification is objected to by the Examiner.

10) The drawing(s) filed on _____ is/are: a) accepted or b) objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a) All b) Some * c) None of:
 1. Certified copies of the priority documents have been received.
 2. Certified copies of the priority documents have been received in Application No. _____.
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) Notice of References Cited (PTO-892)
 2) Notice of Draftsperson's Patent Drawing Review (PTO-948)
 3) Information Disclosure Statement(s) (PTO/SB/08)
 Paper No(s)/Mail Date _____

4) Interview Summary (PTO-413)
 Paper No(s)/Mail Date. _____

5) Notice of Informal Patent Application
 6) Other: _____

DETAILED ACTION

Response to Amendment

1. Receipt is acknowledged of applicant's amendment filed 08/24/2009. Claims 4, 30-31, and 34-35 are pending and an action on the merits is as follows.
2. Claims has been amended previous 112, first paragraph rejection is hereby withdrawn.
3. Applicant's amendments with respect to claims have been considered but are moot in view of the new grounds of rejection. The examiner notes that the indication of allowable subject matter claims 30, 31 and 34-35 are withdrawn in view of newly discovered prior art. Furthermore, the finality of the last office action is hereby withdrawn.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Haruki et al. (US 2001/0003410 A1) in view of Im et al. (US 6,454,967 B1).

Regarding claim 4, Haruki et al. (Haruki, hereafter) teaches (Figures 1 and 3) plasma display panel, comprising: a first substrate (1); a plurality of first electrodes (2a,2b) provided on the first substrate (1); a plurality of second electrodes (3a,3b) provided on the first substrate (1), the first (2) and second electrodes (3) being provided in a first direction; a second substrate (8); a plurality of address electrodes (10) provided on the second substrate (8) in a second direction, the first direction being different from the second direction; a plurality of barrier ribs (11) provided on the second substrate (8) in the second direction; a plurality of discharge cells (13), each cell provided between two adjacent barrier ribs (11), and having corresponding first (2), second (3) and address electrodes (11); a green phosphor (12) material provided to a first prescribed number of discharge cells; a red phosphor (12) material provided to a second prescribed number of discharge cells; and a blue phosphor (12) material provided to a third prescribed number of discharge cells (13) (Paragraph 31, lines 11-14) wherein the green phosphor material comprises a first class phosphor material of $Zn_2SiO_4:Mn$, (Paragraph 57, lines 1-5) and the third class phosphor material comprising at least one of $BaAl_{12}O_{19}:Mn$, $BaAl_{14}O_{23}:Mn$, or $Ba(Sr,Ma)AlO: Mn$,

Haruki is silent regarding wherein the weight of the third class phosphor material to total weight is 1~25%.

In the same field of endeavor Im teaches wherein the weight of the third class phosphor material to total weight is 1:3 ratio in order to provide a device with improved color temperature and brightness. Even though he does specifically mention 1~25% as recited in the claim one of ordinary skill at the time could apply his teachings to modify

the device Haruki wherein the weight of the third class phosphor material to total weight is 1~25% ratio in order to provide a device with improved color temperature and brightness as taught by Im et al.

Moreover, the applicant has not established the critical nature of 1~25%. "The law is replete with cases in which the difference between the claimed invention and the prior art is some range or other variable within the claims. In such a situation, the applicant must show that the particular range is critical, generally by showing that the claimed range achieves unexpected results relative to the prior art range." In re Woodruff, 919 F.2d 1575, 16 USPQ2d 1934 (Fed. Cir.1990). To establish unexpected results over a claimed range, applicants should compare a sufficient number of tests inside and outside the claimed range to show criticality of the claimed range. In re Hill, 284 F.2d 955, 128 USPQ 197(CCPA 1960).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have various ranges for the purpose of improved color temperature and brightness as taught by Im et al.

6. Claims 30-31 and 34-35are rejected under 35 U.S.C. 103(a) as being unpatentable over Haruki et al. (US 2001/0003410 A1) in view of Zachau et al. (US 6,380,669 B1) and in further view of Im et al. (US 6,454,967).

Regarding claim 30, Haruki teaches (Figures 1 and 3) a plasma display panel, comprising: a first substrate (1);a plurality of first electrodes (2a,2b) provided on the first substrate (1);a plurality of second electrodes (3a,3b) provided on the first substrate (1), the first (2) and second electrodes (3) being provided in a first direction; a second

substrate (8); a plurality of address electrodes (10) provided on the second substrate (8) in a second direction, the first direction being different from the second direction; a plurality of barrier ribs (11) provided on the second substrate (8) in the second direction; a plurality of discharge cells(13), each cell provided between two adjacent barrier ribs (11), and having corresponding first (2), second (3) and address electrodes (11); a green phosphor (12) material provided to a first prescribed number of discharge cells; a red phosphor (12) material provided to a second prescribed number of discharge cells; and a blue phosphor (12) material provided to a third prescribed number of discharge cells (13) (Paragraph 31, lines 11-14) wherein the green phosphor material comprises a first class phosphor material of $Zn_2SiO_4:Mn$, (Paragraph 48, lines 1-5) and a second class phosphor material comprising at least one of $LaPO_4:Tb$, $Y_3Al_5(BO_3)_4Tb$, $Y(Al,Ga)_5O_{12}:Tb$, $YBO_3:Tb$, or $(Y, Gd)BO_3:Tb$ (Paragraph 48, lines 1-5), or at least one of $BaAl_{12}O_{19}: Mn$, $BaAl_{14}O_{23}:Mn$, or $Ba(Sr,Ma)AlO: Mn$ (Paragraph 57, lines 1-5).

Haruki is silent regarding a green phosphor compound with a first class phosphor, a second class phosphor and a third class phosphor.

In the same field of endeavor of plasma display, Zachau et al. teaches a green phosphor compound with a first class phosphor ($Zn_2SiO_4:Mn$,) (Column 3, lines 20-25), a second class phosphor ($Y,Gd)BO_3:Tb$) (Column 3, lines 29-31) and a third class phosphor ($BaAl_{14}O_{23}:Mn$) (Column 3, lines 20-25) in order to increase the luminance efficiency of the green material and allow for more color coordinates to be achieved (Column 3, lines 30-35), thus allowing for an improved display of green color.

Therefore one of ordinary skill in the art at the time of the invention could modify the plasma display of Haruki wherein the green phosphor compound containing a first class phosphor, a second class phosphor and a third class phosphor in order to increase the luminance efficiency of the green material and allow for more color coordinates to be achieved, thus allowing for an improved display of green color as taught by Zachau et al.

Haruki as modified by Zachau et al. is silent regarding wherein the weight of the third class phosphor material to total weight is 1~25%.

In the same field of endeavor Im teaches wherein the weight of the third class phosphor material to total weight is 1:3 ratio in order to provide a device with improved color temperature and brightness. Even though he does specifically mention 1~25% as recited in the claim one of ordinary skill at the time could apply his teachings to modify the device Haruki wherein the weight of the third class phosphor material to total weight is 1~25% ratio in order to provide a device with improved color temperature and brightness as taught by Im et al.

Moreover, the applicant has not established the critical nature of 1~25%. "The law is replete with cases in which the difference between the claimed invention and the prior art is some range or other variable within the claims. In such a situation, the applicant must show that the particular range is critical, generally by showing that the claimed range achieves unexpected results relative to the prior art range." In re Woodruff, 919 F.2d 1575, 16 USPQ2d 1934 (Fed. Cir.1990). To establish unexpected results over a claimed range, applicants should compare a sufficient number of tests

inside and outside the claimed range to show criticality of the claimed range. In re Hill, 284 F.2d 955, 128 USPQ 197(CCPA 1960).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have various ranges for the purpose of improved color temperature and brightness as taught by Im et al.

Regarding claim 31, Haruki teaches wherein the second class phosphor material comprises $(Y, Gd)BO_3:Tb$ or $Y_3Al_5(BO_3)_4Tb$ (Paragraph 57, lines 1-4); Haruki does not explicitly teach a third class phosphor material, he rather discloses comprises $BaAl_{12}O_{19}: Mn$ (Paragraph 57, lines 5-7) as an alternative to be mixed with the Zinc Silicate.

However, Zachau et al. teaches a green phosphor comprising all three components (Column 3, lines 20-30) in order to increase the luminance efficiency of the green material and allow for more color coordinates to be achieved (Column 3, lines 30-35.), thus allowing for an improved display of green color.

Therefore one of ordinary skill in the art at the time of the invention could modify the plasma display of Haruki teaches wherein the second class phosphor material comprises $(Y, Gd)BO_3:Tb$ or $Y_3Al_5(BO_3)_4Tb$ and the third class phosphor material comprises $BaAl_{12}O_{19}: Mn$ in order to increase the luminance efficiency of the green material and allow for more color coordinates to be achieved, thus allowing for an improved display of green color as taught by Zachau et al.

Regarding claim 34, Haruki teaches wherein the second class phosphor to the first class phosphor is 25 ~80 wt % (Paragraph 48, lines 1-3).

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Regarding claim 35, Haruki teaches wherein the second class phosphor to the first class phosphor is 25~80 wt % (Paragraph 57, lines 48, lines 1-3 or Paragraph 55, lines 10-13).

Response to Arguments

Applicant's arguments with respect to claim 4 have been considered but are moot in view of the new ground(s) of rejection.

Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tracie Green whose telephone number is (571)270-3104. The examiner can normally be reached on Mon-Thurs 7:00am-5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nimesh Patel can be reached on 571-272-2457. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

/Tracie Green/
Examiner, Art Unit 2879

/Sikha Roy/
Primary Examiner, Art Unit 2879